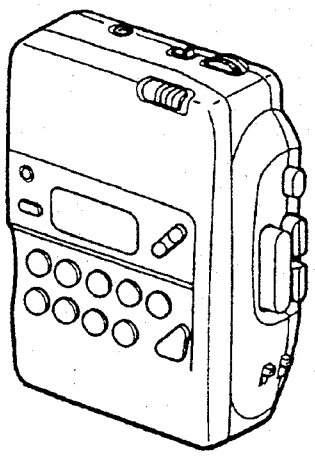
WM-FX40

SERVICE MANUAL



US Model
Canadian Model
AEP Model
UK Model
E Model

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Model Name Using Similar Mechanism	WM-2051
Tape Transport Mechanism	MT-WM2051-43

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MICROFILM

RADIO CASSETTE PLAYER

SONY®

GENERAL

Messages, warnings and tips

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

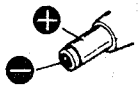
Precautions

Notes on battery

- Romove the battrey when you will not use the unit for a long time to prevent damage from battery leakage and corrosion.
- When the sound becomes unstable, try a new battery.

External power sources

Use only the recommended AC power adaptor or car battery cord manufactured by Sony. Polarity of the plugs of other manufacturers may be different.



Polarity of this plug

Test equipment, Jigs and Material

Test equipment

Digital multimeter
FM RF signal generator
AM RF signal generator
Stabilized power supply
Speed checker
Wow and Flutter
Frequency counter
VTVM

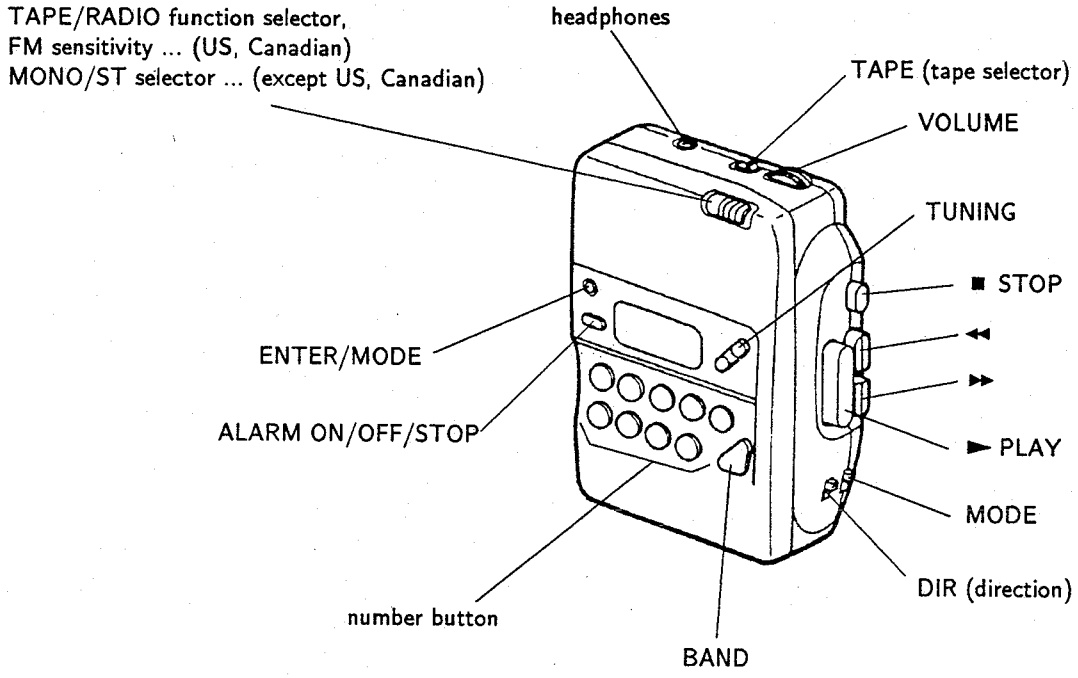
Jigs

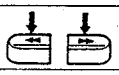
Test tape	Part Number
- WS-48A (3kHz, 0dB)	7-819-032-11
Cassette type torque meter	
- CQ-102C (normal direction)	8-909-708-22
- CQ-102RC (reverse direction)	8-909-708-26
- CQ-201B (FF and REW)	8-909-708-41

Screw locking compound

Neji lock G (1401B)	7-432-114-11

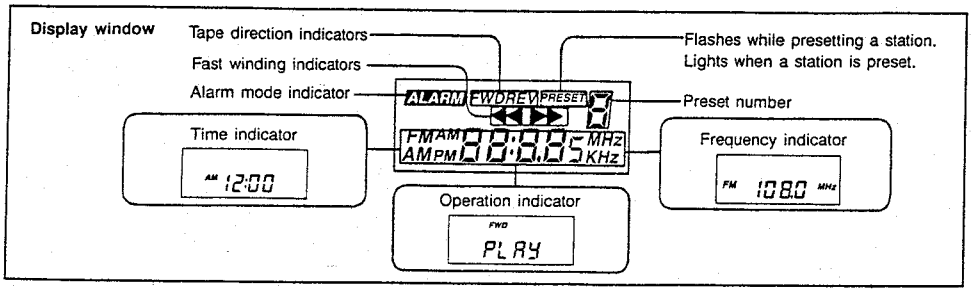
Location and Function of Controls



On Tape Operation	
To listen to the other side of the cassette during playback	
To stop the tape	
To wind the tape rapidly	
To check the direction of the tape transportation	See FWD or REV indicator.

To Use According to Your Tape	
For normal (TYPE I) tapes	
For CrO_2 (TYPE II) tapes or metal (TYPE IV) tapes	

On Playback Mode	
To play back both sides of the cassette once If you begin playback on the reverse side, the unit will shut off at the end of that side of the tape.	
To play back both sides of the cassette repeatedly	



User's Instruction

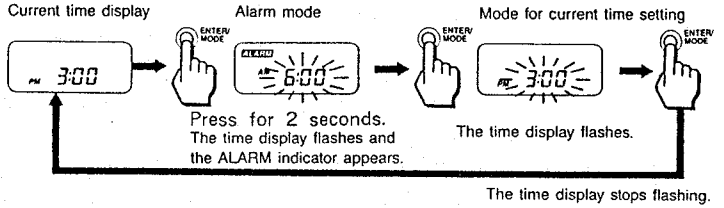
Clock Operation

Before operation, install the batteries.

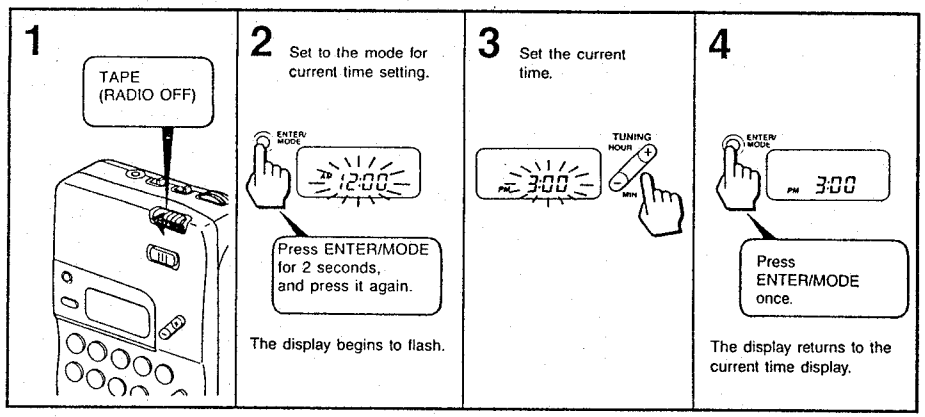
How to Use the ENTER/MODE Button

You can change the operation mode in sequence by pressing the ENTER/MODE button.

Set the function selector to TAPE (RADIO OFF).



Setting the Current Time

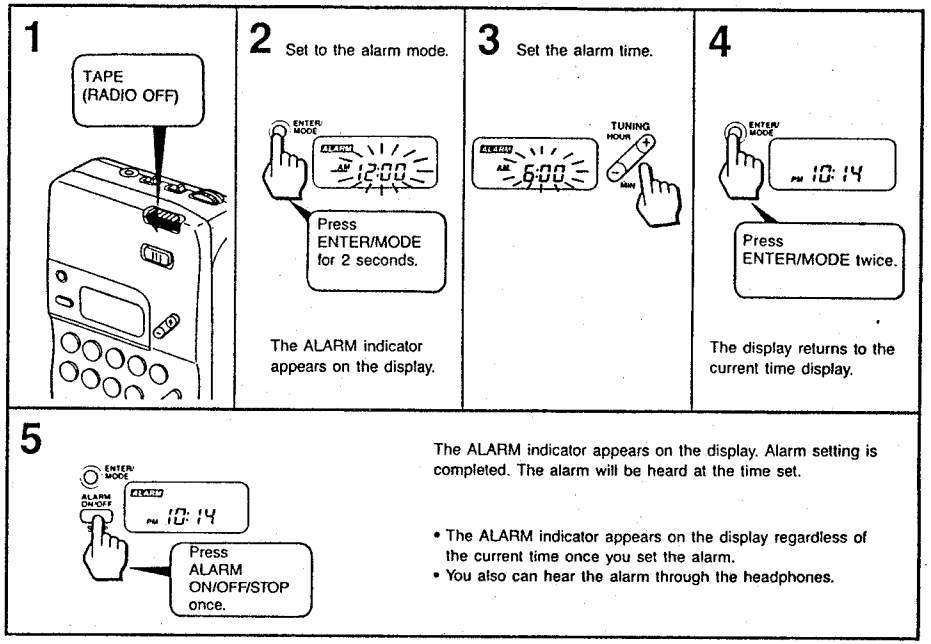


- If you keep pressing the HOUR and MIN (minute) buttons, the digits advance in sequence.
- The hour display does not advance even when the minute display returns to "00" after "59".

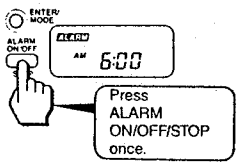
To change the hour display

The hour display is on a 12-hour cycle.
To change it to 24-hour cycle, press TUNING – for about 2 seconds.
To return it to 12-hour cycle, press TUNING + for about 2 seconds.

Setting the Alarm

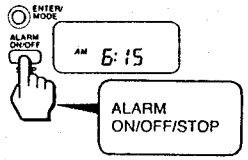

1
TAPE (RADIO OFF)
2
Set to the alarm mode.
12:00
Press ENTER/MODE for 2 seconds.
The ALARM indicator appears on the display.
3
Set the alarm time.
TUNING HOUR
6:00
4
10:14
Press ENTER/MODE twice.
The display returns to the current time display.
5
ALARM ON/OFF
10:14
Press ALARM ON/OFF/STOP once.
The ALARM indicator appears on the display. Alarm setting is completed. The alarm will be heard at the time set.
• The ALARM indicator appears on the display regardless of the current time once you set the alarm.
• You also can hear the alarm through the headphones.

To stop the alarm



- If you do not press the ALARM ON/OFF/STOP button, the alarm will stop automatically after 3 minutes.
- The preset alarm time cannot be canceled even if you press the ALARM ON/OFF/STOP button.

To cancel the alarm



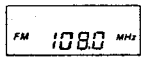
ALARM indicator goes off.

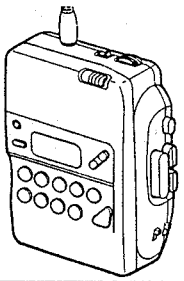
Preset Tuning

You can preset up to 9 stations in each band (AM, FM).
Preset a station while the PRESET indicator flashes for 10 seconds.

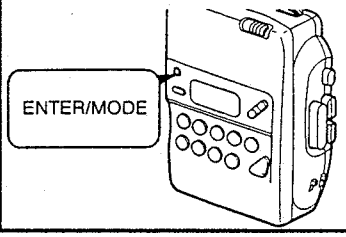
Presetting the Stations

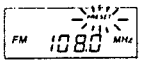
1 Tune in the desired station.
Accorder sur la station désirée.
Sintonice la emisora deseada.





2 Press the ENTER/MODE button.
Appuyer sur la touche ENTER/MODE.
Presione la tecla ENTER/MODE.

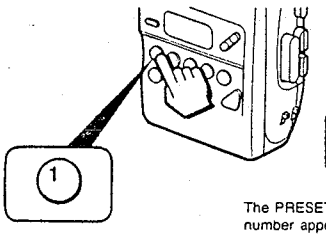


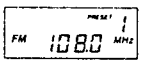


3 Put the station into memory.
Example: To preset the station on the 1 button

Mettre la station en mémoire.
Exemple: Préréglage sur la touche 1

Memorice la emisora.
Ejemplo: para memorizarla en la tecla 1.





The PRESET indicator stops flashing. The preset number appears. Presetting is completed.

Le témoin PRESET s'arrête de clignoter. Le numéro préréglé apparaît. Le préréglage est terminé.

La indicación PRESET dejará de parpadear. Aparecerá el número de memorización y la emisora quedará memorizada.

To stop the presetting operation
After pressing the ENTER/MODE button, leave the unit for 5 seconds. The PRESET indicator goes off.

—US model—

To Use the Unit Abroad

This unit is factory preset to tune in the stations of the frequency range of U.S.A. and Canada. When you use the unit in other countries, change the receivable frequency range.

1 Turn on the radio.
2 **To use in Japan**
Keep ALARM ON/OFF/STOP and then TUNING + pressed for 7 seconds. The receivable frequency range becomes as follows.
FM 76.0 – 90 MHz (100 kHz step)
AM 531 – 1,710 kHz (9 kHz step)

To use in other countries
Keep ALARM ON/OFF/STOP and then TUNING – pressed for 7 seconds. The receivable frequency range becomes as follows.
FM 87.5 – 108 MHz (50 kHz step)
AM 531 – 1,602 kHz (9 kHz step)

To return to the frequency range of U.S.A. and Canada, keep ALARM ON/OFF/STOP pressed for 7 seconds.

When the frequency range has changed, the display turns off and turns on again with beep sound. The display will show the frequency of that you changed to.

Note
If you change the frequency range, all preset stations, current time, and alarm time are canceled.

If the Display Shows Incorrect Information

1 Turn on the radio.
2 Keep ALARM pressed for 7 seconds.
The display turns off and turns on again with beep sound. The display will show AM 530 kHz.
All preset stations, current time, and alarm time are canceled.

—Canadian, E model—

To Use the Unit Abroad

This unit is factory preset to tune in the stations of the local frequency range. When you use the unit in other countries, change the receivable frequency range.

To the customers in Canada

This unit is factory preset to tune in the stations of Canada and the U.S.A

To use in other countries:

1 Turn on the radio.
2 Keep ALARM ON/OFF/STOP and then TUNING − pressed for 7 seconds.
The receivable frequency range becomes as follows.
FM 87.5 − 108 MHz (50 kHz step)
AM 531 − 1,602 kHz (9 kHz step)

To the customers in other countries

This unit is factory preset to tune in the stations of Europe.

To use in the U.S.A. and Canada:

1 Turn on the radio.
2 Keep ALARM/ON/OFF/STOP and then TUNING − pressed for 7 seconds.
The receivable frequency range becomes as follows.
FM 87.5 − 108 MHz (100 kHz step)
AM 530 − 1,710 kHz (10 kHz step)

To use in Japan

1 Turn on the radio.
2 Keep ALARM ON/OFF/STOP and then TUNING + pressed for 7 seconds.
The receivable frequency range becomes as follows.
FM 76.0 − 90 MHz (100 kHz step)
AM 531 − 1,710 kHz (9 kHz step)

To return to the factory preset frequency range, keep ALARM ON/OFF/STOP pressed for 7 seconds.

When the frequency range has changed, the display turns off and turns on again with the beep sound. The display will show the frequency of that you changed to.

If the display shows incorrect information

1 Turn on the radio.
2 Keep ALARM pressed for 7 seconds.
The display turns off and turns on again with beep sound.
The display will show AM 530 kHz for Canada and AM 531 kHz for other countries.
All preset stations, current time, and alarm time are canceled.

—AEP, UK, IT model—

If the display shows incorrect information

1 Turn on the radio.
2 Keep ALARM pressed for 7 seconds.
The display turns off and turns on again with beep sound.
The display will show AM 531 kHz (AM 522 kHz for Italy).
All preset stations, current time, and alarm time are canceled.

Service Notes

Flexible Circuit Board Repairing

-Keep the temperature of the soldering iron around 270℃ during repairing.
-Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
-Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on Chip Component Replacement

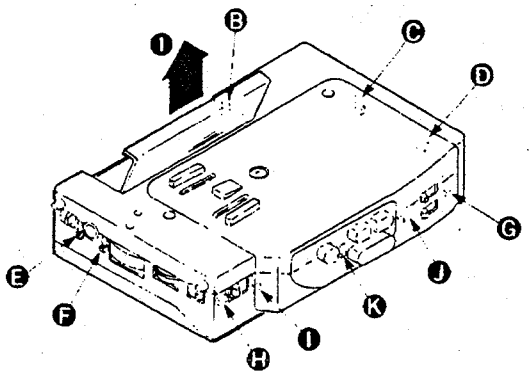
-Never reuse a disconnected chip component.
-Notice that the minus side of a tantalum capacitor may be damaged by heat.

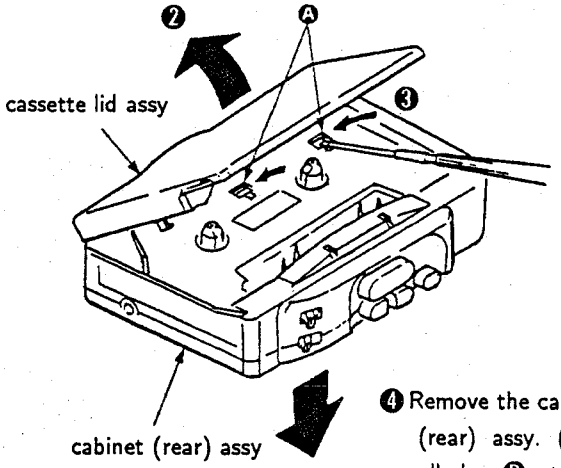
REMOVAL

Note :

-Follow the removal procedue in the numerical order given.

Cabinet (rear) assy

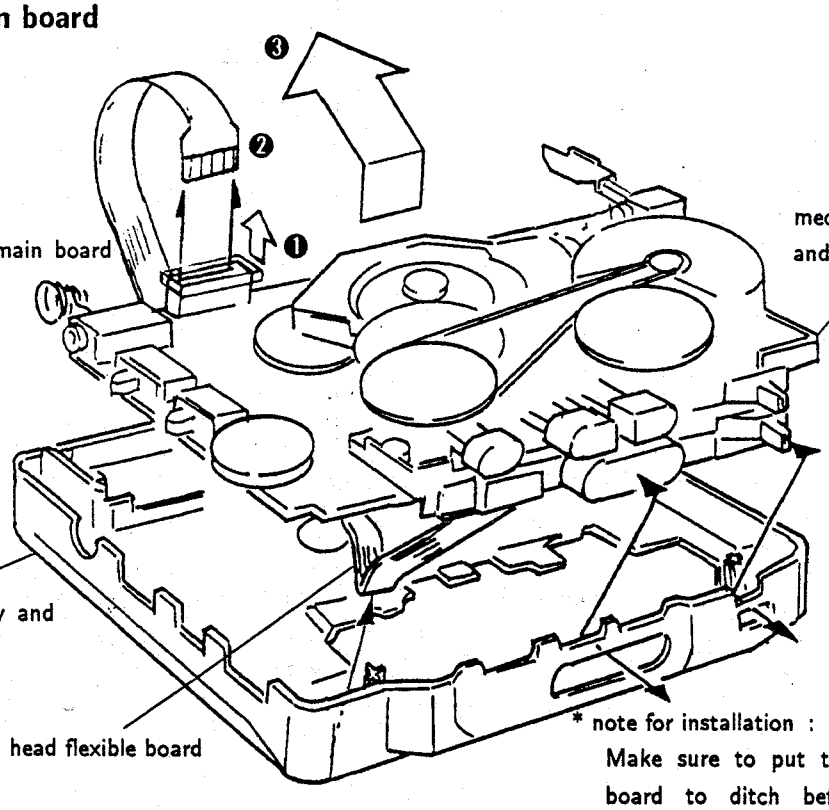




❸ Insert the precision screw driver (1.4mm flat-blade) in to the slit at claw Ⓐ and release the claw.

❹ Remove the cabinet (rear) assy. (Release all claw Ⓑ to Ⓚ in alphabetical order.)

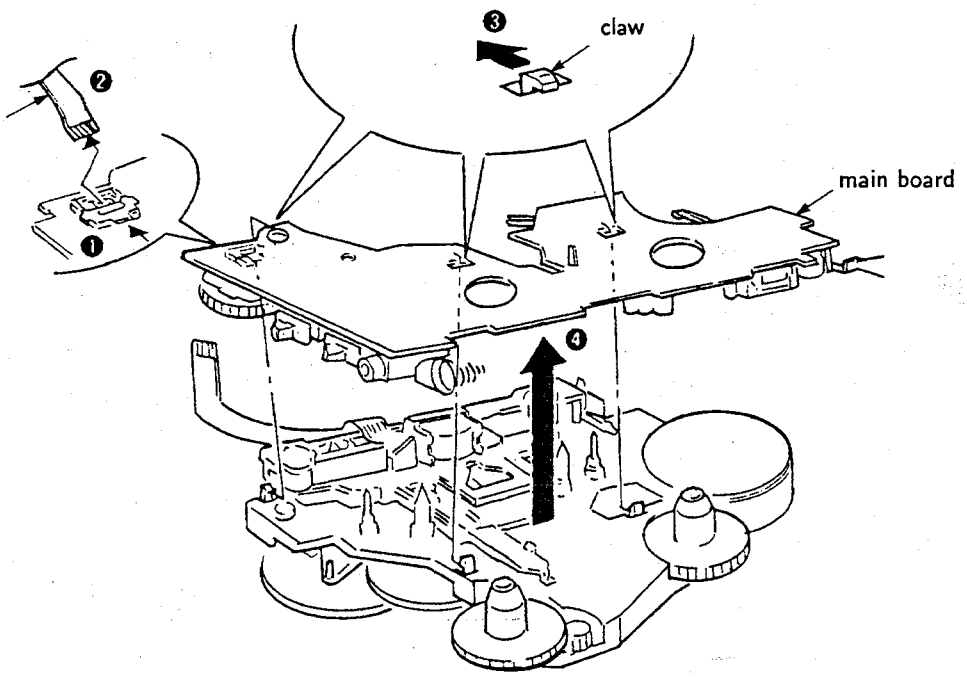
Mechanism and Main board



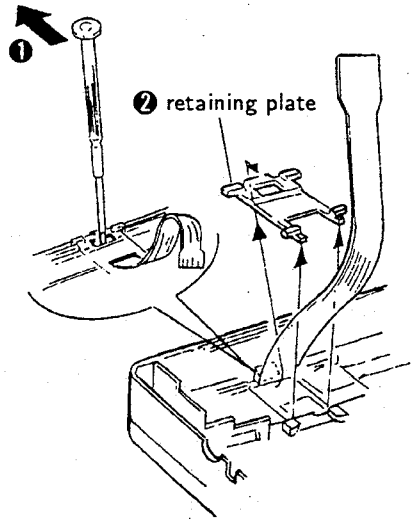
❸ Remove mechanism deck main board to the direction of arrow.

* note for installation :
Make sure to put the head flexible board to ditch before install the mechanism deck and main board.

Main board

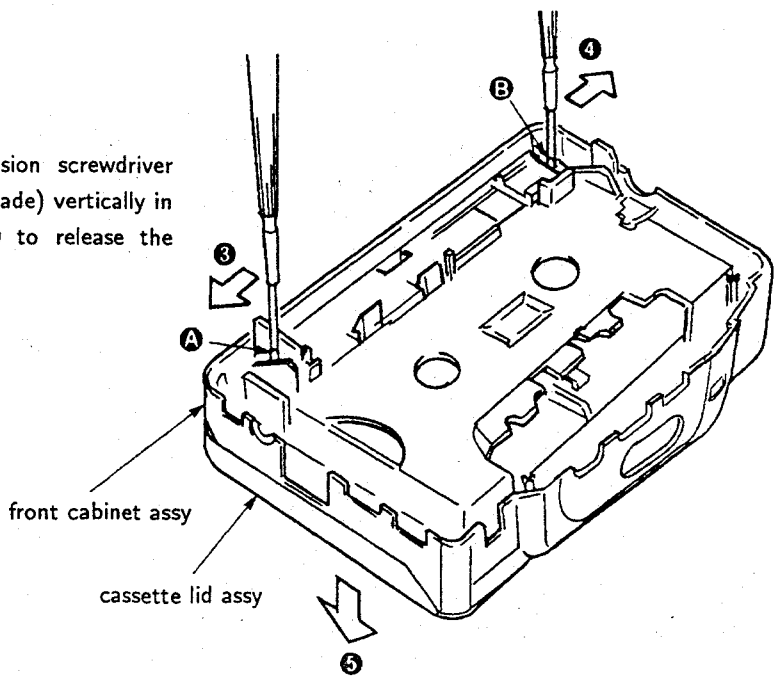


Cassette lid assy

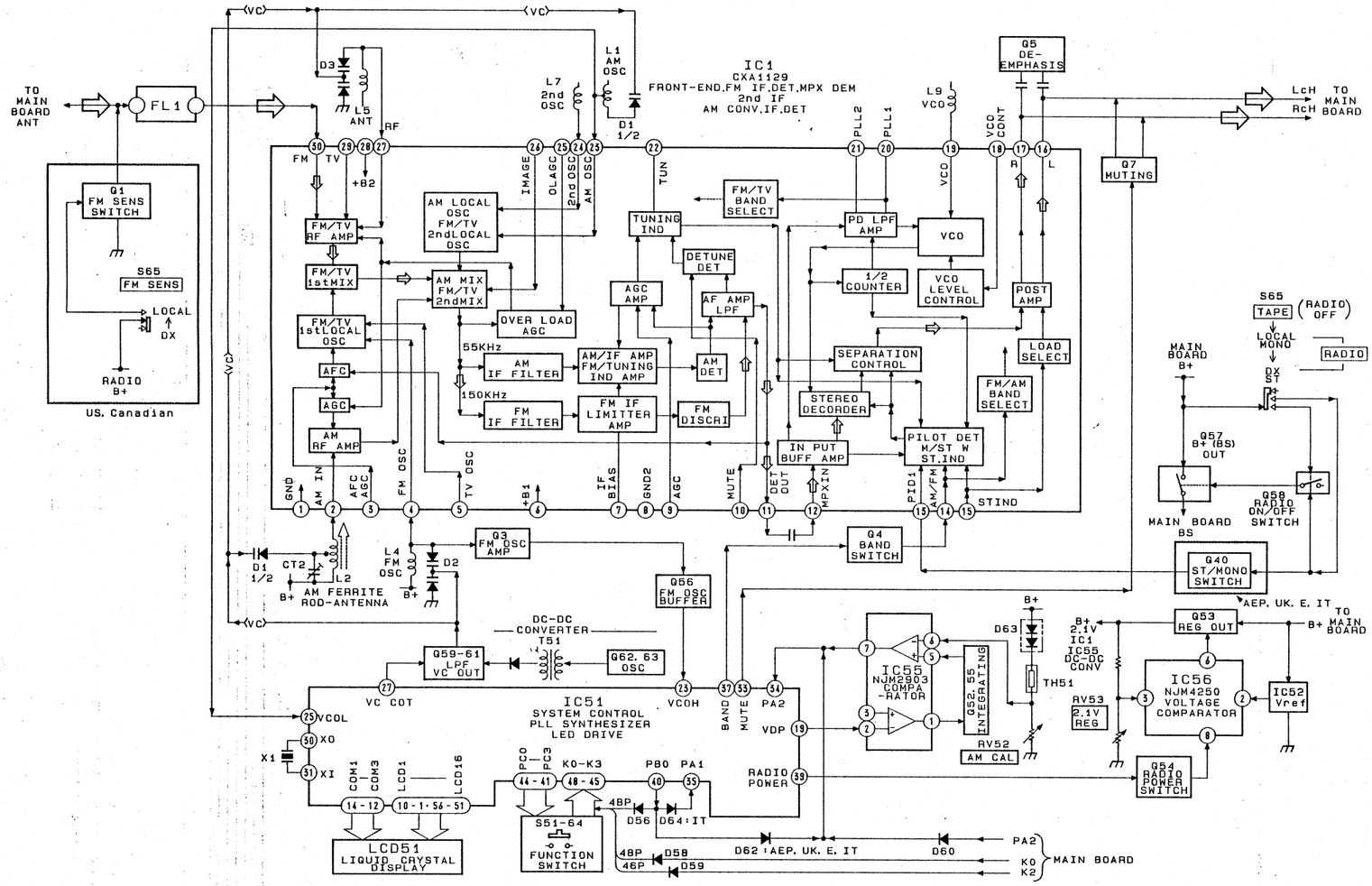


❹ Portion Ⓑ to release the hinge plate

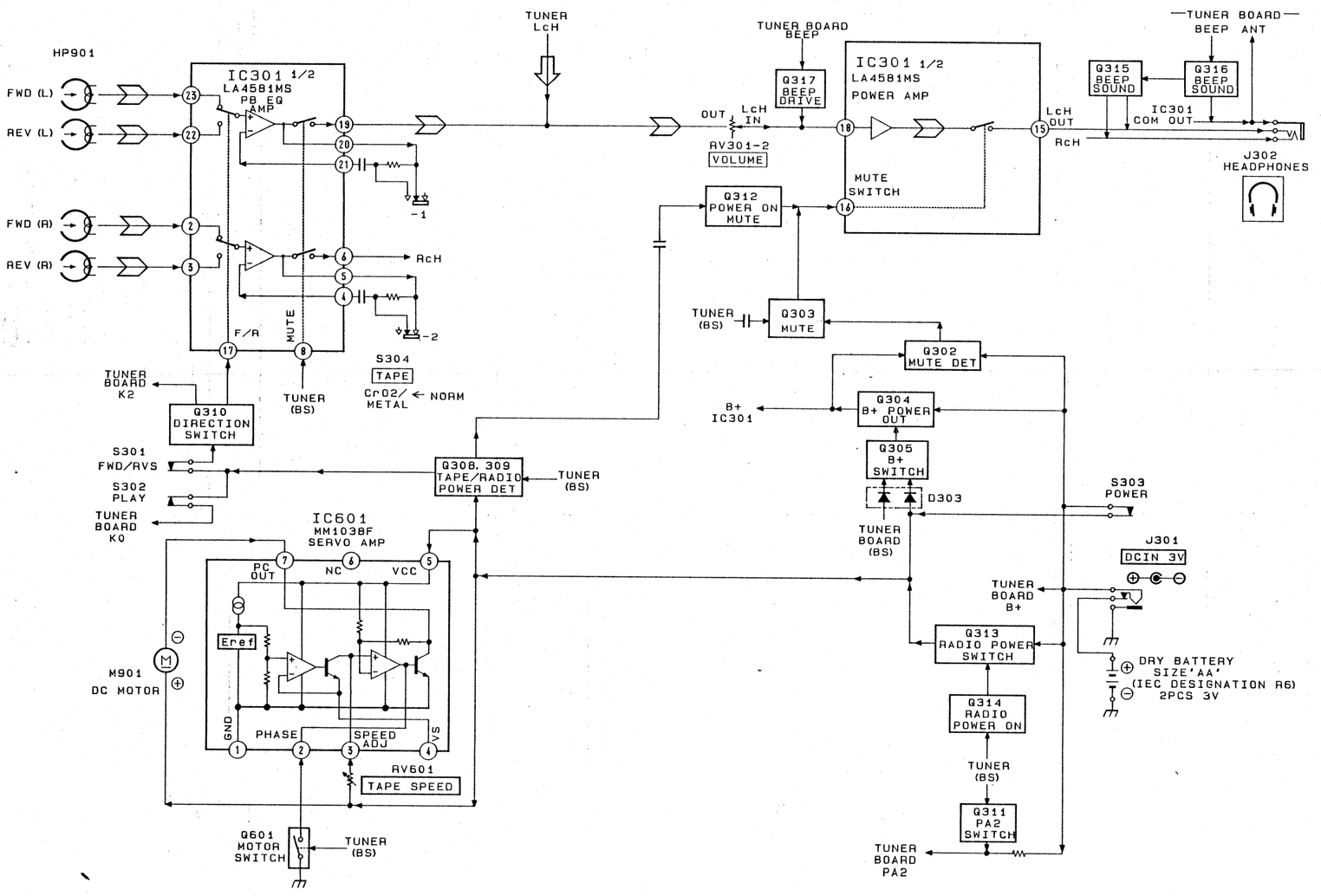
❸ Insert a precision screwdriver (1.4mm flat-blade) vertically in to portion Ⓐ to release the hinge plate.



Tuner Section

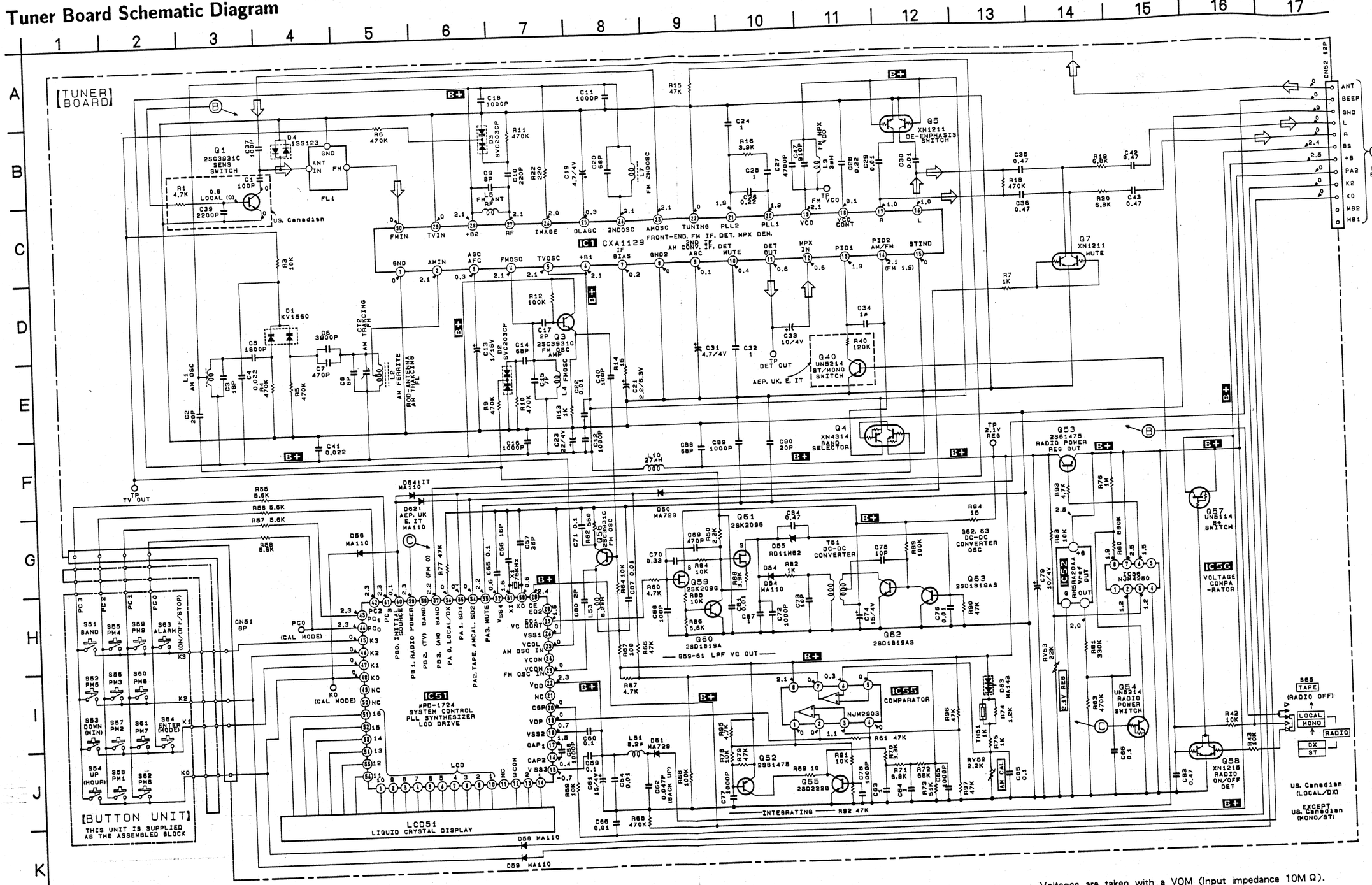


Audio Section



SCHEMATICS AND BOARD DIAGRAMS

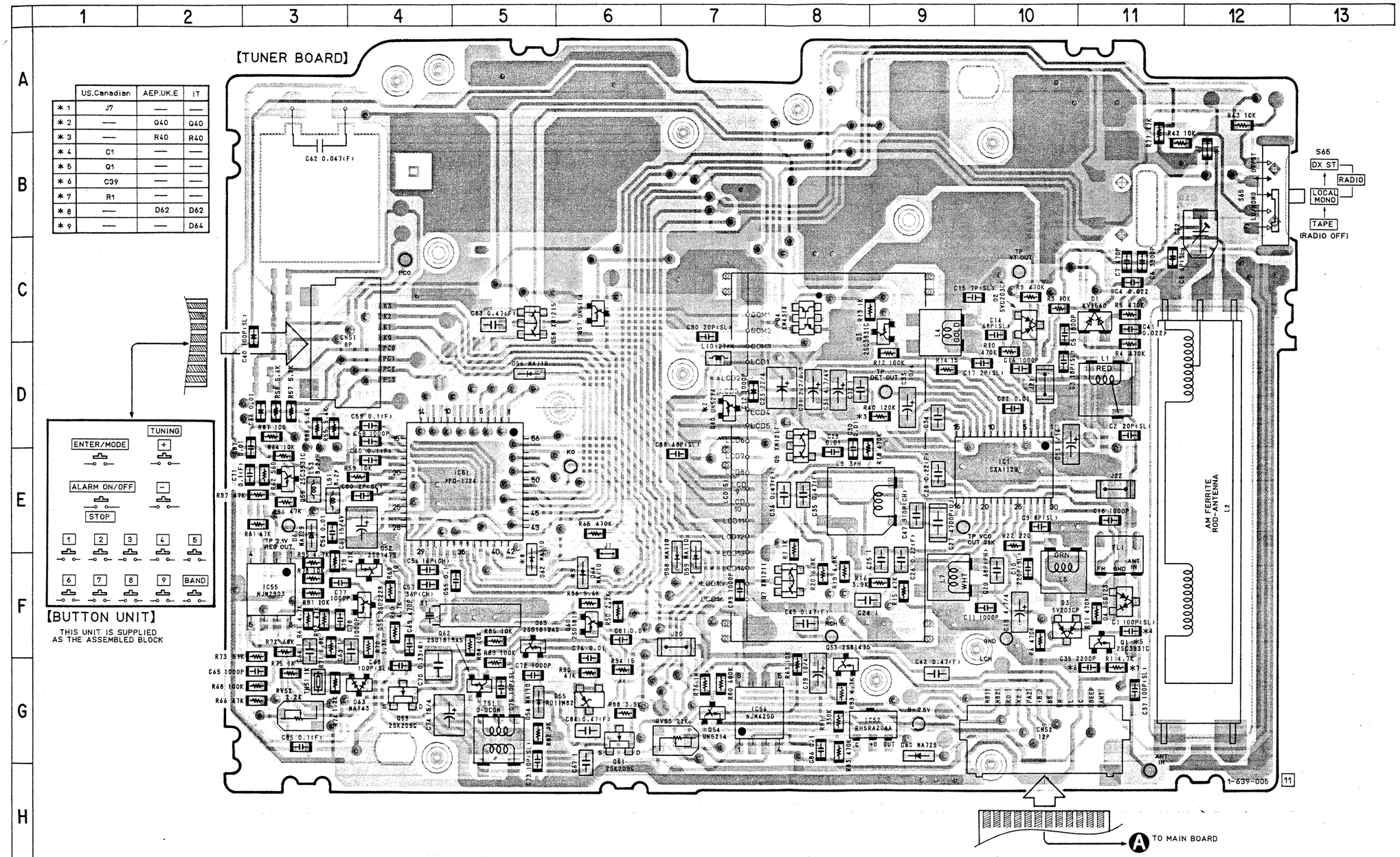
Tuner Board Schematic Diagram



Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- △ : internal component.
- B+ : B+ Line
- ▭ : adjustment for repair.
- Power voltage is dc 2.5V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : AM
  ( ) : FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM

Tuner Board Printed Wiring Boards



	US.Canadian	AEP.UK.E	IT
* 1	J7	—	—
* 2	—	Q40	Q40
* 3	—	R40	R40
* 4	C1	—	—
* 5	Q1	—	—
* 6	C39	—	—
* 7	R1	—	—
* 8	—	D62	D62
* 9	—	—	D64

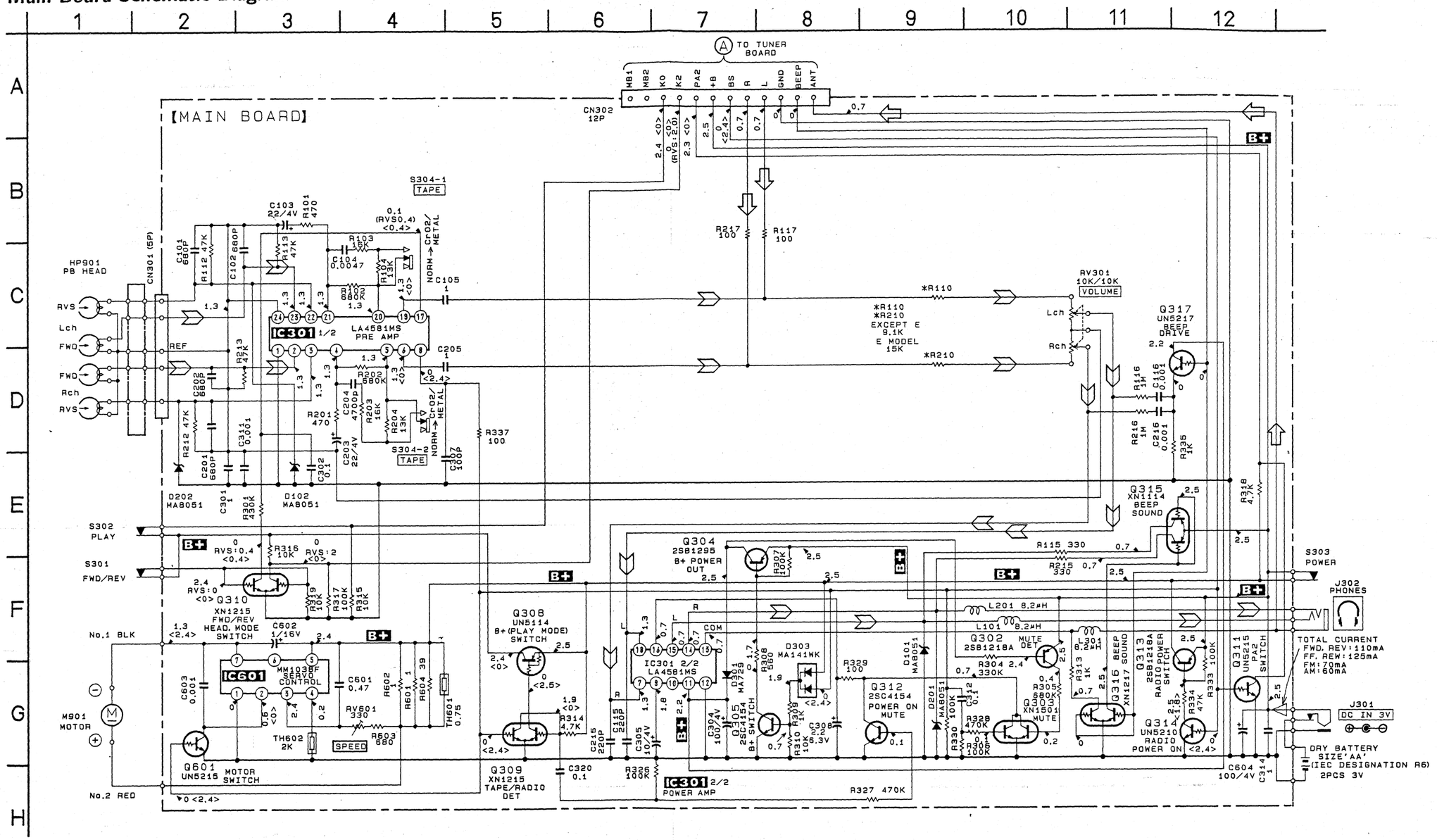
Semiconductor Location

Ref. No.	Location
D1	C-11
D2	C-10
D3	F-10
D4	F-11
D54	G-5
D55	G-6
D56	D-5
D58	F-7
D59	F-7
D60	G-9
D61	E-3
D62	F-5
D63	G-4
D64	F-6
IC1	E-10
IC51	E-5
IC52	G-9
IC55	F-3
IC56	G-7
Q1	F-11
Q3	C-9
Q4	C-8
Q5	E-8
Q7	F-8
Q40	D-7
Q52	F-4
Q53	G-8
Q54	G-7
Q55	F-4
Q56	E-3
Q57	C-6
Q58	C-5
Q59	G-4
Q60	F-6
Q61	G-6
Q62	G-5
Q63	F-5

Note :

- O— : parts extracted from the component side.
- [ ]← indicates side identified with part number.
- ● : Through hole.
- ▒▒ : Pattern on the side which is seen.
- ▒▒ : Pattern of the rear side.

Main Board Schematic Diagram



Note :

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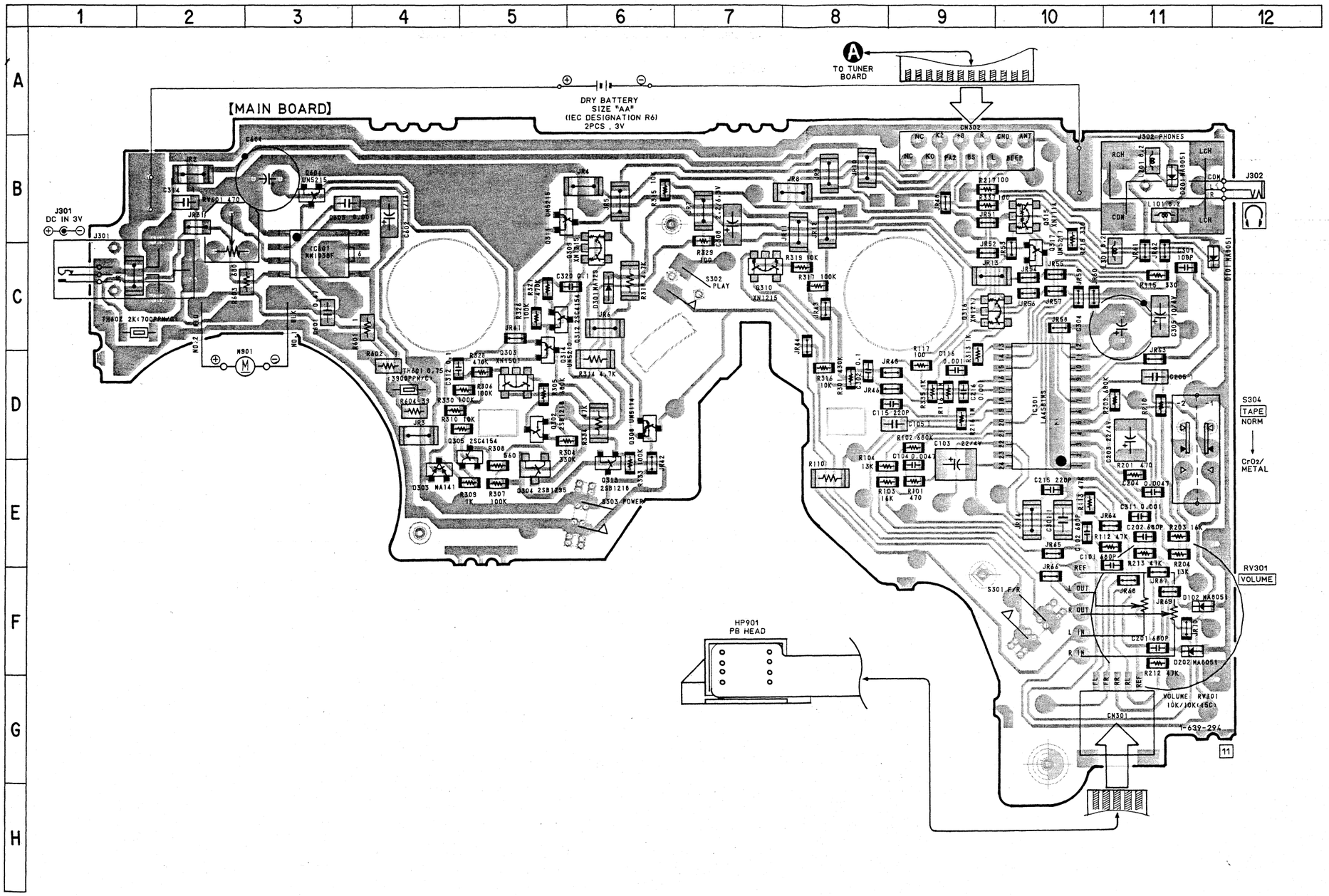
- All resistors are in Ω and ¼W or less unless otherwise specified.
- B+ : B+ Line
- ▭ : adjustment for repair.

- Total current is measured with no cassette installed.
- Power voltage is dc 2.5V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FWD
  ( ) : SELECT MODE
  〈 〉 : RADIO

- Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM ⇨ : PB

Main Board Printed Wiring Boards



Note :

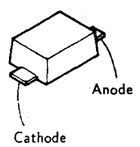
- O— : parts extracted from the component side.
- ▒▒ : Pattern on the side which is seen.

Semiconductor Location

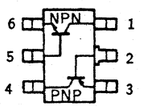
Ref. No.	Location
D101	C-12
D102	F-11
D201	B-11
D202	F-11
D301	C-6
D303	E-4
IC301	D-10
IC601	B-3
Q302	D-5
Q303	D-5
Q304	E-5
Q305	D-5
Q308	D-6
Q309	C-6
Q310	C-7
Q311	B-5
Q312	C-5
Q313	E-6
Q314	D-5
Q315	B-10
Q316	C-9
Q317	C-10
Q601	C-3

Semiconductor layouts

MA8051
MA729
MA110

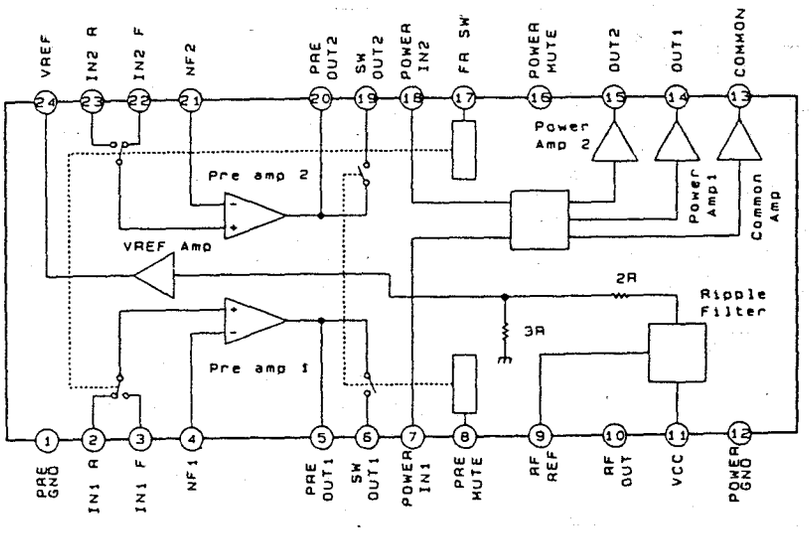


XN4314



IC layouts

IC301 LA4581MS



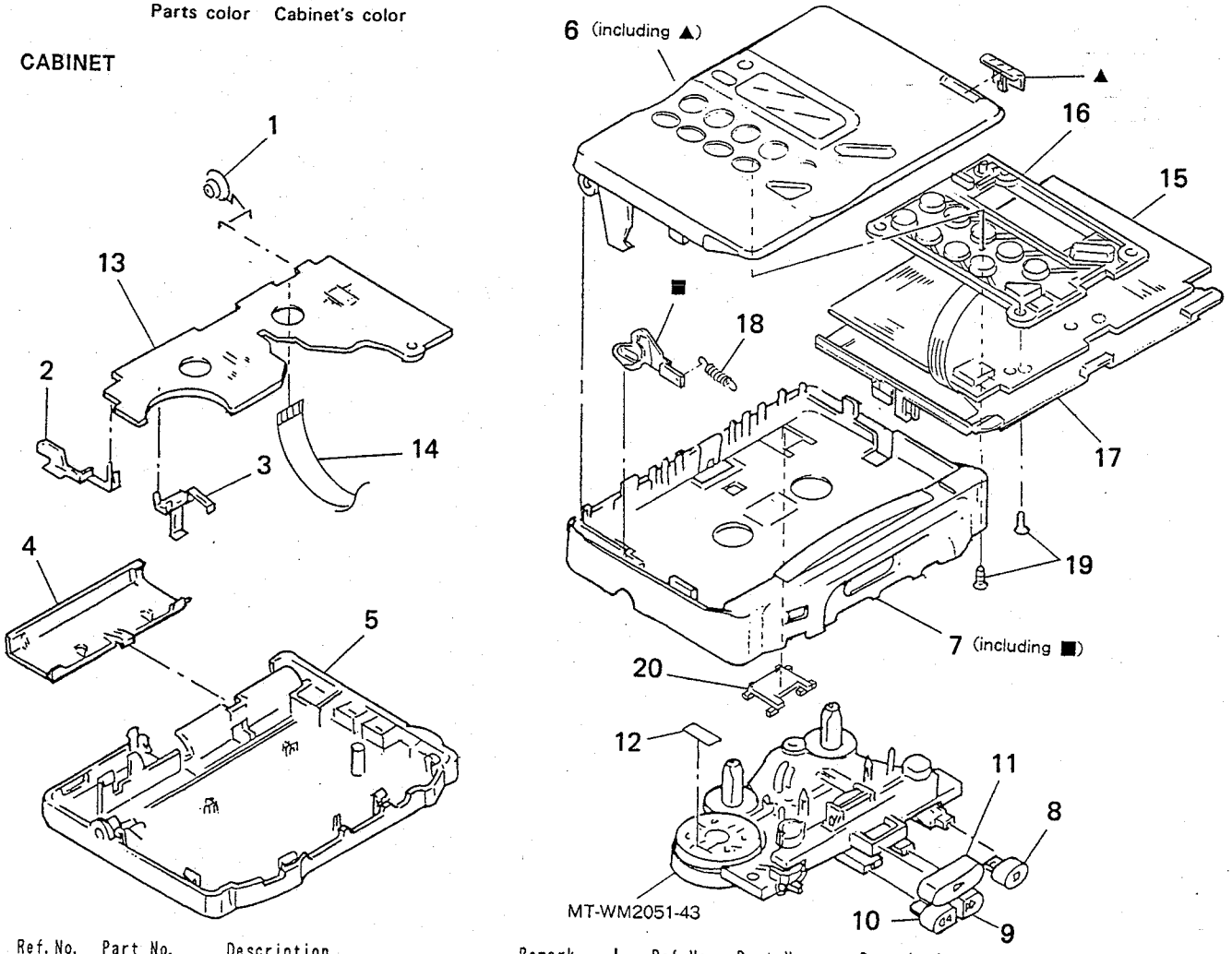
SPARE PARTS LIST

Exploded Views and Mechanical Parts

NOTE:

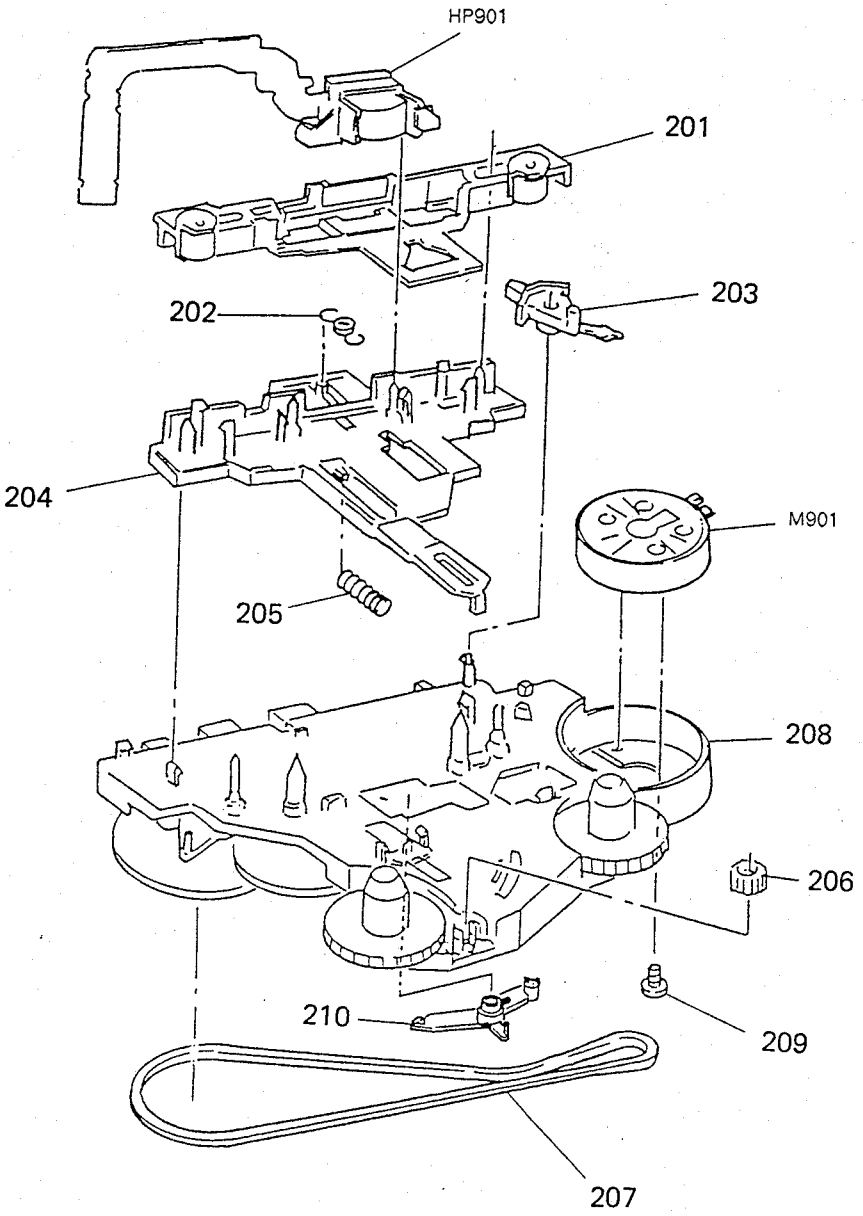
- −XX, −X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)....(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- IT : Italian model

CABINET



Ref. No.	Part No.	Description	Remark
1	3-358-149-01	SPRING	
2	3-358-121-01	TERMINAL (PLUS), BATTERY	
3	* 3-367-320-01	SPRING, MOTOR GROUND	
4	3-368-374-01	LID, BATTERY CASE	
5	X-3363-018-1	CABINET (REAR) ASSY (CF-2)	
6	X-3363-016-1	LID ASSY (CF-1), CASSETTE (US, CND)	
6	X-3363-017-1	LID ASSY (CF-1), CASSETTE (AEP, UK, E, IT)	
7	X-3363-015-1	CABINET (FRONT) ASSY (CF-1)	
8	3-358-115-11	BUTTON (STOP)	
9	3-366-504-21	BUTTON (FF)	
10	3-366-505-21	BUTTON (REW)	
11	3-358-114-11	BUTTON (PLAY)	
12	3-831-441-11	CUSHION (B)	
13	A-3016-077-A	MAIN BOARD, COMPLETE (US, CND, AEP, UK, IT)	
13	A-3016-080-A	MAIN BOARD, COMPLETE (E)	
14	1-639-759-11	CONNECTION FLEXIBLE BOARD	
15	A-3016-078-A	TUNER BOARD, COMPLETE (US, CND)	
15	A-3016-079-A	TUNER BOARD, COMPLETE (UK, E)	
15	A-3016-092-A	TUNER BOARD, COMPLETE (IT)	
15	A-3016-097-A	TUNER BOARD, COMPLETE (AEP)	
16	1-466-528-11	BUTTON UNIT	
17	3-368-377-01	COVER (LID)	
18	3-358-112-01	SPRING, TENSION	
19	3-318-382-41	SCREW (1.7X3.7), TAPPING	
20	3-368-373-01	RETAINER (FLEXIBLE)	

TAPE TRANSPORT (MT-WM2051-43)



Ref. No.	Part No.	Description	Remark
201	X-3347-145-1	PINCH LEVER ASSY	
202	3-362-456-01	SPRING (PINCH)	
203	3-354-887-01	LEVER, D SELECTION	
204	3-354-890-01	LEVER, PLAY	
205	3-354-875-01	SPRING, COMPRESSION	
206	3-354-869-01	GEAR (REVERSE)	
207	3-354-868-01	BELT	
208	X-3358-122-2	CAHSSIS ASSY	
209	3-352-758-11	SCREW (M1.7X2), TOOTHED LOCK	
210	3-354-885-04	LEVER (A), DETECTION	

Ref. No.	Part No.	Description	Remark
HP901	1-543-705-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-541-722-11	MOTOR, DC	

MAIN

Electrical parts

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- –XX, –X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA....: μA...., uPA....: μPA....
  uPB....: μPB...., uPC....: μPC....
  uPD....: μPD....
- CAPACITORS
  uF: μF
- COILS
  uH: μH
- IT : Italian model

Ref. No.	Part No.	Description			Remark
	A-3016-077-A	MAIN BOARD, COMPLETE (US, CND, AEP, UK, IT)			
	A-3016-080-A	MAIN BOARD, COMPLETE (E)			
		**********			
	3-358-121-01	TERMINAL (PLUS), BATTERY			
	3-358-149-01	SPRING			
*	3-367-320-01	SPRING, MOTOR GROUND			
		< CAPACITOR >			
C101	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C102	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C103	1-135-202-21	TANTAL. CHIP	22uF	20%	4V
C104	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C105	1-164-234-11	CERAMIC CHIP	1uF		10V
C115	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C116	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C201	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C202	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C203	1-135-202-21	TANTAL. CHIP	22uF	20%	4V
C204	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C205	1-164-234-11	CERAMIC CHIP	1uF		10V
C215	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C216	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-162-638-11	CERAMIC CHIP	1uF		16V
C302	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C304	1-124-433-00	ELECT	100uF	20%	4V
C305	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C307	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C308	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C311	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C312	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C314	1-164-234-11	CERAMIC CHIP	1uF		10V
C320	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C601	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C602	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C603	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C604	1-124-433-00	ELECT	100uF	20%	4V
		< CONNECTOR >			
CN301	1-569-252-21	HOUSING, CONNECTOR 5P			
CN302	1-568-794-11	SOCKET, CONNECTOR 12P			
		< DIODE >			
D101	8-719-420-90	DIODE	MA8051-M		
D102	8-719-420-90	DIODE	MA8051-M		
D201	8-719-420-90	DIODE	MA8051-M		
D202	8-719-420-90	DIODE	MA8051-M		
D301	8-719-420-51	DIODE	MA729		
D303	8-719-404-35	DIODE	MA141WK		
		< IC >			
IC301	8-759-823-31	IC	LA4581MS		
IC601	8-759-999-06	IC	MM1038F		
		< JACK >			
J301	1-568-228-11	JACK, EXTERNAL POWER (DC IN 3V)			
J302	1-565-287-11	JACK (PHONES)			
		< RESISTOR >			
JR1	1-216-296-00	METAL CHIP	0	5%	1/8W
JR2	1-216-296-00	METAL CHIP	0	5%	1/8W
JR3	1-216-296-00	METAL CHIP	0	5%	1/8W
JR4	1-216-296-00	METAL CHIP	0	5%	1/8W
JR5	1-216-296-00	METAL CHIP	0	5%	1/8W
JR6	1-216-296-00	METAL CHIP	0	5%	1/8W
JR7	1-216-296-00	METAL CHIP	0	5%	1/8W
JR8	1-216-296-00	METAL CHIP	0	5%	1/8W

Ref. No.	Part No.	Description			Remark
JR9	1-216-296-00	METAL CHIP	0	5%	1/8W
JR10	1-216-296-00	METAL CHIP	0	5%	1/8W
JR11	1-216-296-00	METAL CHIP	0	5%	1/8W
JR12	1-216-296-00	METAL CHIP	0	5%	1/8W
JR13	1-216-296-00	METAL CHIP	0	5%	1/8W
JR14	1-216-296-00	METAL CHIP	0	5%	1/8W
JR31	1-216-295-00	METAL CHIP	0	5%	1/16W
JR41	1-216-864-11	METAL CHIP	0	5%	1/16W
JR42	1-216-864-11	METAL CHIP	0	5%	1/16W
JR43	1-216-864-11	METAL CHIP	0	5%	1/16W
JR44	1-216-864-11	METAL CHIP	0	5%	1/16W
JR45	1-216-864-11	METAL CHIP	0	5%	1/16W
JR46	1-216-864-11	METAL CHIP	0	5%	1/16W
JR48	1-216-864-11	METAL CHIP	0	5%	1/16W
JR51	1-216-864-11	METAL CHIP	0	5%	1/16W
JR52	1-216-864-11	METAL CHIP	0	5%	1/16W
JR53	1-216-864-11	METAL CHIP	0	5%	1/16W
JR54	1-216-864-11	METAL CHIP	0	5%	1/16W
JR55	1-216-864-11	METAL CHIP	0	5%	1/16W
JR56	1-216-864-11	METAL CHIP	0	5%	1/16W
JR57	1-216-864-11	METAL CHIP	0	5%	1/16W
JR58	1-216-864-11	METAL CHIP	0	5%	1/16W
JR59	1-216-864-11	METAL CHIP	0	5%	1/16W
JR60	1-216-864-11	METAL CHIP	0	5%	1/16W
JR61	1-216-864-11	METAL CHIP	0	5%	1/16W
JR62	1-216-864-11	METAL CHIP	0	5%	1/16W
JR63	1-216-864-11	METAL CHIP	0	5%	1/16W
JR64	1-216-864-11	METAL CHIP	0	5%	1/16W
JR65	1-216-864-11	METAL CHIP	0	5%	1/16W
JR66	1-216-864-11	METAL CHIP	0	5%	1/16W
JR67	1-216-864-11	METAL CHIP	0	5%	1/16W
JR68	1-216-864-11	METAL CHIP	0	5%	1/16W
JR69	1-216-864-11	METAL CHIP	0	5%	1/16W
JR70	1-216-864-11	METAL CHIP	0	5%	1/16W

< COIL >

L101	1-412-005-11	INDUCTOR CHIP	8.2uH
L201	1-412-005-11	INDUCTOR CHIP	8.2uH
L301	1-412-005-11	INDUCTOR CHIP	8.2uH

< TRANSISTOR >

Q302	8-729-402-55	TRANSISTOR	2SB1218A-R
Q303	8-729-421-23	TRANSISTOR	XN1216
Q304	8-729-807-87	TRANSISTOR	2SB1295-UL6
Q305	8-729-602-21	TRANSISTOR	2SC4154
Q308	8-729-402-96	TRANSISTOR	UN5114
Q309	8-729-403-17	TRANSISTOR	XN1215
Q310	8-729-403-17	TRANSISTOR	XN1215
Q311	8-729-420-50	TRANSISTOR	UN5215
Q312	8-729-602-21	TRANSISTOR	2SC4154TP
Q313	8-729-402-55	TRANSISTOR	2SB1218A-R
Q314	8-729-421-77	TRANSISTOR	UN5210-R
Q315	8-729-422-41	TRANSISTOR	XN1114
Q316	8-729-422-45	TRANSISTOR	XN1217
Q317	8-729-422-48	TRANSISTOR	UN5217
Q601	8-729-420-50	TRANSISTOR	UN5215

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R101	1-216-817-11	METAL CHIP	470	5%	1/16W
R102	1-216-855-11	METAL CHIP	680K	5%	1/16W
R103	1-218-291-11	METAL GLAZE	16K	5%	1/16W
R104	1-216-994-11	METAL GLAZE	13K	5%	1/16W
R110	1-216-221-00	METAL GLAZE	9.1K	5%	1/8W (US, CND, AEP, UK, IT)
R110	1-216-226-00	METAL GLAZE	15K	5%	1/8W (E)
R112	1-216-841-11	METAL CHIP	47K	5%	1/16W
R113	1-216-841-11	METAL CHIP	47K	5%	1/16W
R115	1-216-815-11	METAL CHIP	330	5%	1/16W
R116	1-216-857-11	METAL CHIP	1M	5%	1/16W
R117	1-216-809-11	METAL CHIP	100	5%	1/16W
R201	1-216-817-11	METAL CHIP	470	5%	1/16W
R202	1-216-855-11	METAL CHIP	680K	5%	1/16W
R203	1-218-291-11	METAL GLAZE	16K	5%	1/16W
R204	1-216-994-11	METAL GLAZE	13K	5%	1/16W
R210	1-218-345-11	METAL GLAZE	9.1K	5%	1/16W (US, CND, AEP, UK, IT)
R210	1-216-835-11	METAL CHIP	15K	5%	1/16W (E)
R212	1-216-841-11	METAL CHIP	47K	5%	1/16W
R213	1-216-841-11	METAL CHIP	47K	5%	1/16W
R215	1-216-815-11	METAL CHIP	330	5%	1/16W
R216	1-216-857-11	METAL CHIP	1M	5%	1/16W
R217	1-216-809-11	METAL CHIP	100	5%	1/16W
R301	1-218-448-11	METAL GLAZE	430K	5%	1/16W
R304	1-216-851-11	METAL CHIP	330K	5%	1/16W
R305	1-216-855-11	METAL CHIP	680K	5%	1/16W
R306	1-216-845-11	METAL CHIP	100K	5%	1/16W
R307	1-216-845-11	METAL CHIP	100K	5%	1/16W
R308	1-216-818-11	METAL CHIP	560	5%	1/16W
R309	1-216-821-11	METAL CHIP	1K	5%	1/16W
R310	1-216-833-11	METAL CHIP	10K	5%	1/16W
R313	1-216-821-11	METAL CHIP	1K	5%	1/16W
R314	1-216-214-00	METAL GLAZE	4.7K	5%	1/8W
R315	1-216-833-11	METAL CHIP	10K	5%	1/16W
R316	1-216-833-11	METAL CHIP	10K	5%	1/16W
R317	1-216-845-11	METAL CHIP	100K	5%	1/16W
R318	1-216-214-00	METAL GLAZE	4.7K	5%	1/8W
R319	1-216-833-11	METAL CHIP	10K	5%	1/16W
R326	1-216-845-11	METAL CHIP	100K	5%	1/16W

MAIN | TUNER | CONNECTION FLEXIBLE

Ref. No.	Part No.	Description			Remark
R327	1-216-853-11	METAL CHIP	470K	5%	1/16W
R328	1-216-853-11	METAL CHIP	470K	5%	1/16W
R329	1-216-809-11	METAL CHIP	100	5%	1/16W
R330	1-216-845-11	METAL CHIP	100K	5%	1/16W
R333	1-216-845-11	METAL CHIP	100K	5%	1/16W
R334	1-216-238-00	METAL GLAZE	47K	5%	1/8W
R335	1-216-821-11	METAL CHIP	1K	5%	1/16W
R337	1-216-809-11	METAL CHIP	100	5%	1/16W
R601	1-217-671-11	METAL CHIP	1	5%	1/10W
R602	1-217-671-11	METAL CHIP	1	5%	1/10W
R603	1-216-045-00	METAL CHIP	680	5%	1/10W
R604	1-216-015-00	METAL CHIP	39	5%	1/10W
		< VARIABLE RESISTOR >			
RV301	1-238-072-11	RES, VAR, CARBON 10K/10K (VOLUME)			
RV601	1-241-126-11	RES, ADJ, CARBON 330 (SPEED)			
		< SWITCH >			
S301	1-571-986-31	SWITCH, LEAF (FWD/REV)			
S302	1-570-395-11	SWITCH, LEAF (PLAY)			
S303	1-571-986-11	SWITCH, LEAF (POWER)			
S304	1-571-478-11	SWITCH, SLIDE (TAPE)			
		< THERMISTOR >			
TH601	1-809-003-11	THERMISTOR, POSITIVE (0.75)			
TH602	1-809-275-21	THERMISTOR, POSITIVE (2K)			
**********					
	A-3016-078-A	TUNER BOARD, COMPLETE (US, CND)			
	A-3016-079-A	TUNER BOARD, COMPLETE (UK, E)			
	A-3016-092-A	TUNER BOARD, COMPLETE (IT)			
	A-3016-097-A	TUNER BOARD, COMPLETE (AEP)			
		**********			
	1-639-759-11	CONNECTION FLEXIBLE BOARD			
		**********			
	1-535-898-11	CONDUCTIVE BOARD, CONNECTION			
*	3-368-371-01	CASE, SHIELD			
		< CAPACITOR >			
C1	1-162-953-11	CERAMIC CHIP	100PF	5%	50V (US, CND)
C2	1-164-113-11	CERAMIC CHIP	20PF	5%	50V
C3	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C4	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C5	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C6	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C7	1-162-962-11	CERAMIC CHIP	470PF	10%	50V

Ref. No.	Part No.	Description			Remark
C8	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C9	1-162-939-11	CERAMIC CHIP	8PF	0.5PF	50V
C10	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C11	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C12	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C13	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C14	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C15	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V
C16	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C17	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C18	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C19	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C20	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C21	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C22	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C23	1-135-202-21	TANTAL, CHIP	22uF	20%	4V
C24	1-164-234-11	CERAMIC CHIP	1uF		10V
C25	1-164-234-11	CERAMIC CHIP	1uF		10V
C26	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C27	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
C28	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C29	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C30	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C31	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C32	1-164-234-11	CERAMIC CHIP	1uF		10V
C33	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C34	1-164-234-11	CERAMIC CHIP	1uF		10V
C35	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C36	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C37	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C39	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V (US, CND)
C40	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C41	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C42	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C43	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C47	1-163-140-00	CERAMIC CHIP	910PF	5%	50V
C54	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C55	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C56	1-164-237-11	CERAMIC CHIP	16PF	10%	50V
C57	1-164-238-11	CERAMIC CHIP	36PF	10%	50V
C58	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C59	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C60	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C61	1-135-158-21	TANTALUM CHIP	15uF	20%	4V
C62	1-125-689-11	ELECT DIBLE LAYER	0.047F		5V
C63	1-164-234-11	CERAMIC CHIP	1uF		10V
C64	1-164-234-11	CERAMIC CHIP	1uF		10V
C65	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V

Ref. No.	Part No.	Description			Remark
C66	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C67	1-164-234-11	CERAMIC CHIP	1uF	10V	
C68	1-162-953-11	CERAMIC CHIP	100PF	5% 50V	
C69	1-162-962-11	CERAMIC CHIP	470PF	10% 50V	
C70	1-164-006-11	CERAMIC CHIP	0.33uF	10% 16V	
C71	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C72	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C73	1-162-941-11	CERAMIC CHIP	10PF	0.5PF 50V	
C74	1-135-158-21	TANTALUM CHIP	15uF	20% 4V	
C75	1-162-941-11	CERAMIC CHIP	10PF	0.5PF 50V	
C76	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C77	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C78	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C79	1-135-201-11	TANTALUM CHIP	10uF	20% 4V	
C80	1-162-932-11	CERAMIC CHIP	2PF	0.25PF 50V	
C81	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C83	1-164-005-11	CERAMIC CHIP	0.47uF	25V	
C84	1-164-005-11	CERAMIC CHIP	0.47uF	25V	
C85	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C86	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C87	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C88	1-162-951-11	CERAMIC CHIP	68PF	5% 50V	
C89	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C90	1-164-113-11	CERAMIC CHIP	20PF	5% 50V	
		< CONNECTOR >			
CN51	1-568-558-21	HOUSING, CONNECTOR (FPC) 8P			
CN52	* 1-573-536-11	HOUSING, CONNECTOR 12P			
		< TRIMMER >			
CT2	1-141-327-11	CAP, VAR, TRIMMER (CHIP TYPE) (AM TRACKING)			
		< DIODE >			
D1	8-719-951-05	DIODE	KV1560		
D2	8-719-939-02	DIODE	SVC203CP		
D3	8-719-939-02	DIODE	SVC203CP		
D4	8-719-800-76	DIODE	1SS226		
D54	8-719-404-46	DIODE	MA110		
D55	8-719-106-62	DIODE	RD11M-B2		
D56	8-719-404-46	DIODE	MA110		
D58	8-719-404-46	DIODE	MA110		
D59	8-719-404-46	DIODE	MA110		
D60	8-719-420-51	DIODE	MA729-TX		
D61	8-719-420-51	DIODE	MA729-TX		
D62	8-719-404-46	DIODE	MA110 (AEP, UK, E, IT)		
D63	8-719-404-52	DIODE	MA143-TW		
D64	8-719-404-46	DIODE	MA110-TX (IT)		

Ref. No.	Part No.	Description			Remark
		< FILTER >			
FL1	1-239-108-11	FILTER, BAND PASS			
		< IC >			
IC1	8-752-050-43	IC	CXA1129N		
IC51	8-759-153-67	IC	uPD1724-GB-558-1A7		
IC52	8-759-518-40	IC	RH5RA20AB		
IC55	8-759-981-65	IC	LM2903M		
IC56	8-759-711-93	IC	NJM4250M		
		< RESISTOR >			
J1	1-216-864-11	METAL CHIP	0	5% 1/16W	
J7	1-216-864-11	METAL CHIP	0	5% 1/16W	(US, CND)
J20	1-216-296-00	METAL CHIP	0	5% 1/8W	
J21	1-216-296-00	METAL CHIP	0	5% 1/8W	
J22	1-216-296-00	METAL CHIP	0	5% 1/8W	
		< COIL >			
L1	1-460-165-21	COIL (WITH CORE)			
L2	1-402-564-11	ANTENNA, FERRITE-ROD			
L4	1-460-164-21	COIL (WITH CORE)			
L5	1-460-171-11	COIL (WITH CORE) (FM ANT)			
L7	1-460-163-21	COIL (WITH CORE)			
L9	1-412-763-21	COIL 3mH (FM MPX VCO)			
L10	1-412-011-31	INDUCTOR CHIP	27uH		
L51	1-412-005-11	INDUCTOR CHIP	8.2uH		
L53	1-412-005-11	INDUCTOR CHIP	8.2uH		
		< LIQUID CRYSTAL >			
LCD51	1-809-341-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q1	8-729-423-52	TRANSISTOR	2SC3931-C	(US, CND)	
Q3	8-729-423-52	TRANSISTOR	2SC3931-C		
Q4	8-729-429-72	TRANSISTOR	XN4314-TX		
Q5	8-729-429-92	TRANSISTOR	XN1211		
Q7	8-729-429-92	TRANSISTOR	XN1211		
Q40	8-729-421-26	TRANSISTOR	UN5216QRS	(AEP, UK, E, IT)	
Q52	8-729-145-04	TRANSISTOR	2SB1475-B43		
Q53	8-729-145-04	TRANSISTOR	2SB1475-B43		
Q54	8-729-421-26	TRANSISTOR	UN5216QRS		
Q55	8-729-144-16	TRANSISTOR	2SD222844D45		
Q56	8-729-423-52	TRANSISTOR	2SC3931-C		
Q57	8-729-402-96	TRANSISTOR	UN5114		
Q58	8-729-403-17	TRANSISTOR	XN1215		
Q59	8-729-220-93	TRANSISTOR	2SK209-G		
Q60	8-729-420-27	TRANSISTOR	2SD1819AQRS		

TUNER

Ref. No.	Part No.	Description				Remark
Q61	8-729-220-93	TRANSISTOR	2SK209-G			
Q62	8-729-420-27	TRANSISTOR	2SD1819AQRS			
Q63	8-729-420-27	TRANSISTOR	2SD1819AQRS			
		< RESISTOR >				
R1	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	(US, CND)
R3	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R4	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R5	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R6	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R7	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R9	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R10	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R11	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R12	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R13	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R14	1-216-799-11	METAL CHIP	15	5%	1/16W	
R15	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R16	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R18	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R19	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R20	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R22	1-216-813-11	METAL CHIP	220	5%	1/16W	
R40	1-216-846-11	METAL CHIP	120K	5%	1/16W	(AEP, UK, E, IT)
R42	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R43	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R50	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R55	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R56	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R57	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R58	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R59	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R60	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R61	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R62	1-216-818-11	METAL CHIP	560	5%	1/16W	
R63	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R64	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R65	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R66	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R67	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R68	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R69	1-216-797-11	METAL CHIP	10	5%	1/16W	
R70	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R71	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R72	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R73	1-218-331-11	METAL GLAZE	51K	5%	1/16W	
R74	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R75	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R76	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R77	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R78	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R79	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R80	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R81	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R82	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R83	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R84	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R85	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R86	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R87	1-216-809-11	METAL CHIP	100	5%	1/16W	
R88	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R89	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R90	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R91	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R92	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R93	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R94	1-216-799-11	METAL CHIP	15	5%	1/16W	
R95	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R96	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R97	1-216-841-11	METAL CHIP	47K	5%	1/16W	
		< VARIABLE RESISTOR >				
RV52	1-238-662-11	RES, ADJ, CERMET 2.2K (AM CAL)				
RV53	1-238-665-11	RES, ADJ, CERMET 22K (2.1V REG)				
		< SWITCH >				
S65	1-571-506-41	SWITCH, SLIDE (TAPE)				
		< TRANSFORMER >				
T51	1-449-021-21	TRANSFORMER, DC-DC CONVERTER				
		< THERMISTOR >				
TH51	1-809-438-11	THERMISTER (CHIP) 1K				
		< CRYSTAL >				
X1	1-577-262-11	VIBRATOR, CRYSTAL (75KHz)				
**********						
		MISCELLANEOUS				
		**********				
16	1-466-528-11	BUTTON UNIT				
HP901	1-543-705-11	HEAD, MAGNETIC (PLAYBACK)				
M901	1-541-722-11	MOTOR, DC				
**********						

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
		**********	
	3-346-518-01	CLIP, BELT	
*	3-365-541-01	CUSHION (UPPER) (CND, AEP, UK, E, IT)	
*	3-365-542-01	INDIVIDUAL CARTON (AEP, UK, IT)	
*	3-365-548-01	INDIVIDUAL CARTON (CND)	
*	3-365-549-01	INDIVIDUAL CARTON (E)	
*	3-365-550-01	CUSHION (UPPER) (US)	
*	3-365-551-01	CARDBOARD (US)	
*	3-365-553-01	CUSHION (LOWER) (CND, AEP, UK, E, IT)	
	3-753-285-11	MANUAL, INSTRUCTION (CND, E) (ENGLISH, FRENCH, SPANISH)	
	3-753-285-21	MANUAL, INSTRUCTION (ENGLISH) (US)	
	3-753-285-41	MANUAL, INSTRUCTION (AEP, UK, IT) (ENGLISH, FRENCH, SPANISH, PORTUGUESE)	
	3-753-285-51	MANUAL, INSTRUCTION (AEP, IT) (GERMAN, DUTCH, SWEDISH, ITALIAN)	
	8-953-341-90	HEADPHONE MDR-14 SET (US, CND, AEP, UK, IT)	
	8-953-400-90	HEADPHONE MDR-E552 SET (E)	

ADJUSTMENTS

Mechanical measurements

Precaution

1. Clean the following parts with a denatured-alcohol-moistened swab :
   playback head pinch roller
   capstan rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5V) unless otherwise noted.

The following measurements are necessary when tape running problems are occured or repaired the tape transport mechanism.

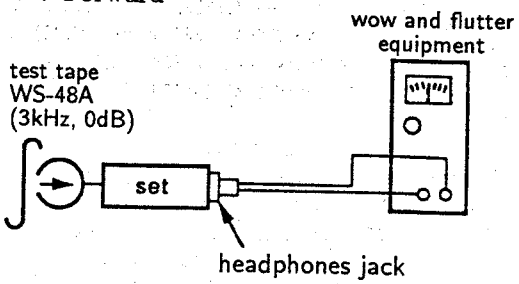
Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	20 - 42 g-cm (0.28 - 0.58 oz-inch)
FWD Back Tension		less than 2 g-cm (less than 0.03 oz-inch)
REV	CQ-102RC	20 - 42 g-cm (0.28 - 0.58 oz-inch)
REV Back Tension		less than 2 g-cm (less than 0.03 oz-inch)
FF, REW	CQ-201B	more than 60 g-cm (more than 0.83 oz-inch)

Wow and Flutter Measurement

procedure :

Function : Tape
Mode : Forward



Playback the center part of the test tape (WS-48A) and measure the wow and flutter at the unweighted position of the wow and flutter equipment.

Specification : Less than 0.6% rms (JIS)

Mechanical adjustments

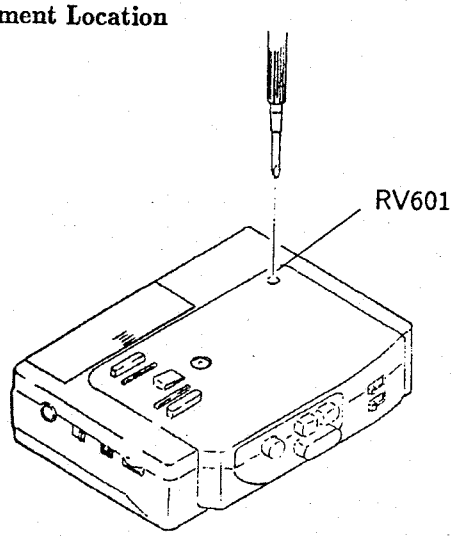
Precaution

- Supplied voltage : 2.5V
- Switch and control position
  DOLBY NR switch : OFF
  TAPE switch : NORM
  MEGA BASS switch : NORM
  VOLUME control : maximum

Tape section

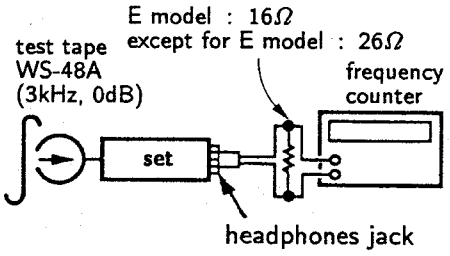
Tape speed adjustment

Adjustment Location



Procedure :

Function : TAPE



1. Playback the center part of test tape (WS-48A) in FWD mode first. Then, change to REV mode. Adjust RV601 so that the frequency counter reads 2970Hz±15Hz in REV mode.
2. Change to FWD mode again. Confirm that the frequency counter reads 2975Hz±35Hz.

Mode	Reading on frequency counter
REV	2970Hz ± 15Hz (Adjust value)
FWD	2975Hz ± 35Hz (Confirm value)

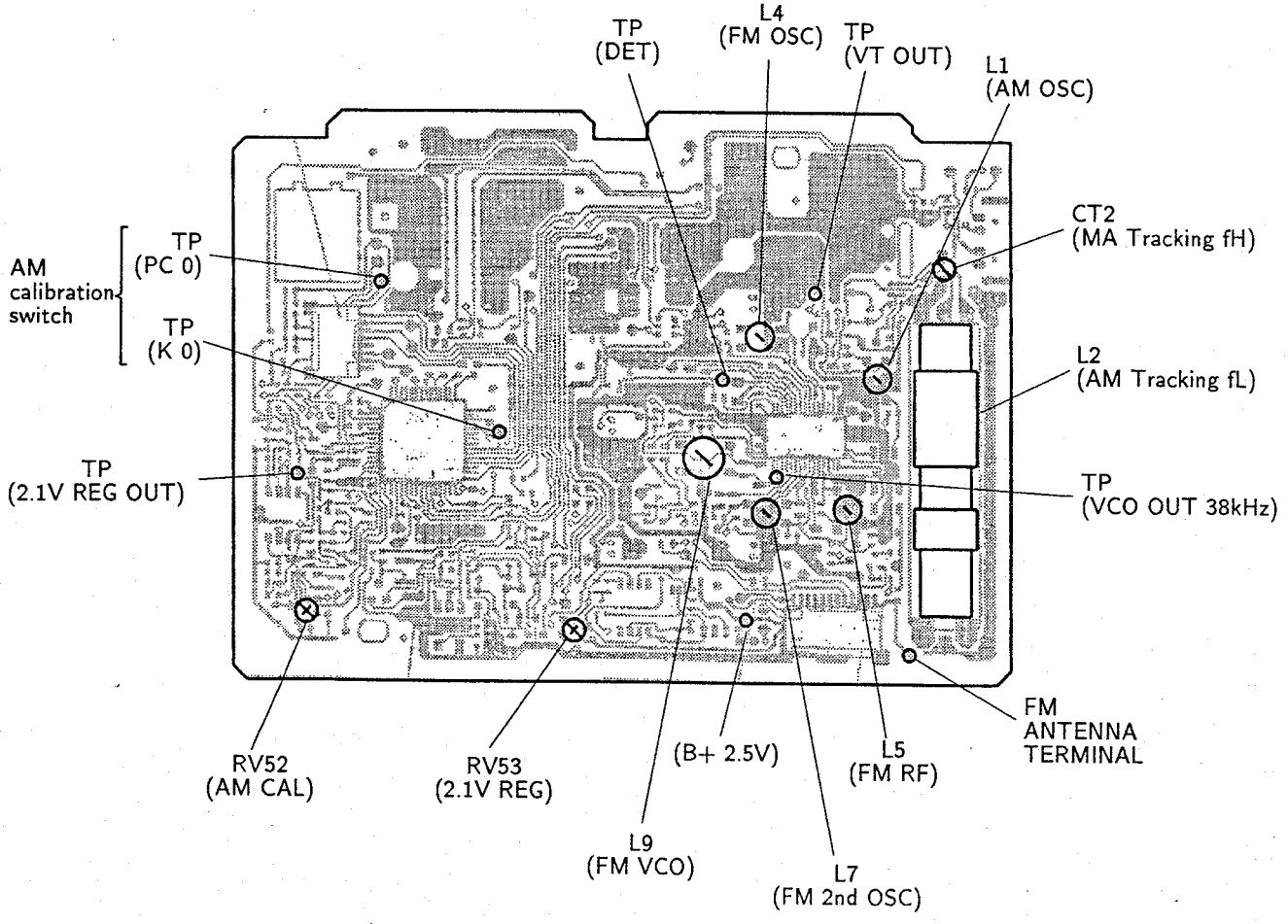
3. Confirm that the tape speed difference between Top part of test tape in FWD mode and End part of test tape in REV mode is less than 1.5%.

Electrical alignments

Tuner Section

Adjustment Location

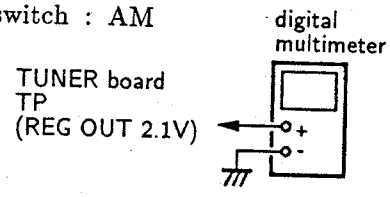
TUNER BOARD
— Component Side —



Power Supply Voltage Adjustment

Function switch : RADIO

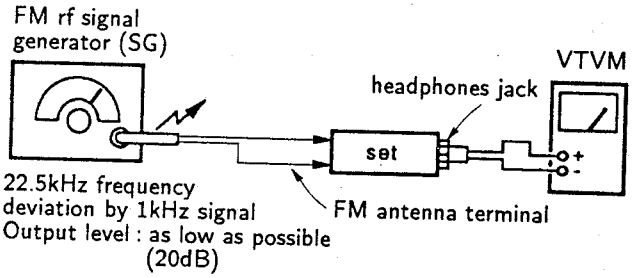
Band switch : AM

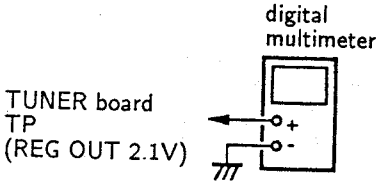


Destination	set frequency	Adjustment part	Reading on digital multimeter
US, Canadian	530kHz	RV53	2.1 ± 0.05V
AEP, UK, E	531kHz		
IT	522kHz		

FM Tuning Voltage Adjustment

NOTE : Follow the adjustment procedure the numerical order given.





Function switch : RADIO

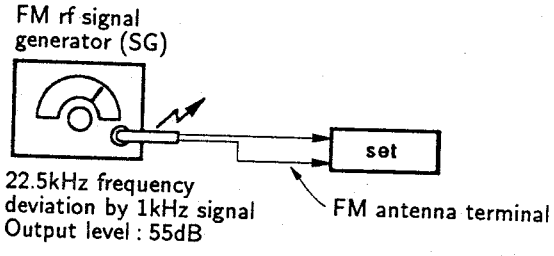
Band switch : FM

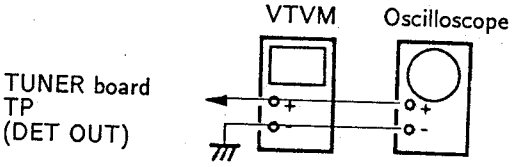
1. Tune the SG and SET frequency to 108MHz.
2. Adjust L4 for 9±0.05 volts on the digital multimeter.
3. Adjust L7 to get the maximum reading of VTVM.
4. Confirm that the digital multimeter of the tuning voltage is within 9±0.05V. Otherwise, repeat the procedure in each adjustment several times since L4 affects L7 and L7 affects L4.
   This adjustment should end with the final adjustment of L7.
   And then, proceed to FM 2nd OSC adjustment.

SG and set frequency	Adjustment part	Reading on digital multimeter (Tuning voltage)	Reading on VTVM
108 MHz	L4	9 ± 0.05V	—
	L7	—	maximum

FM 2nd OSC Adjustment

(This adjustment should be perform after the FM tuning voltage adjustment.)





Function switch : RADIO

Band switch : FM

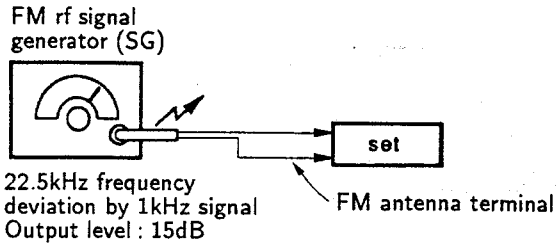
- Turn L7 slowly to confirm the DET OUT voltage within 0.61±0.02 volts.

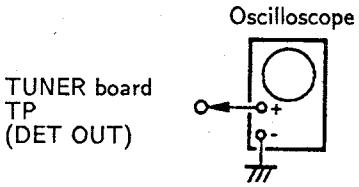
NOTE : L7 should be turn slowly. Otherwise, the waveform of DET OUT may be disappeared.

SG and set frequency	Adjustment part	Reading on VTVM
108 MHz	L7	0.61 ± 0.02V

FM RF Adjustment

NOTE : Follow the adjustment procedure the numerical order given.





Function switch : RADIO
Band switch : FM

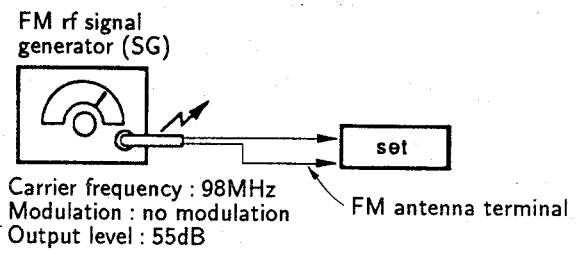
1. Tune the set frequency to 98MHz.
2. Tune the SG frequency to 98MHz and set the output level at 15dB.
3. Adjust L5 to get the maximum waveform of oscilloscope.
4. Check the waveform when the SG frequency tuned 98.04MHz and 97.96MHz.
   It must be smaller waveform than the waveform at 98MHz.
5. If the waveform 98.04MHz and 97.96MHz does not becomes smaller than the waveform at 98 MHz. Repeat the procedure of FM 2nd OSC adjustment and FM RF adjustment.

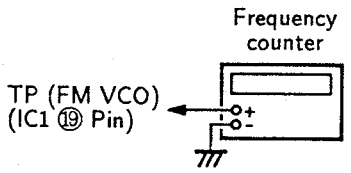
SG and set frequency	Adjustment part	Reading on VTVM
98 MHz	L5	maximum waveform

FM VCO Adjustment

Function switch : RADIO (FM SENS : DX position)
··· US, Canadian
RADIO (FM MODE : ST position)
··· except US, Canadian

Band switch : FM



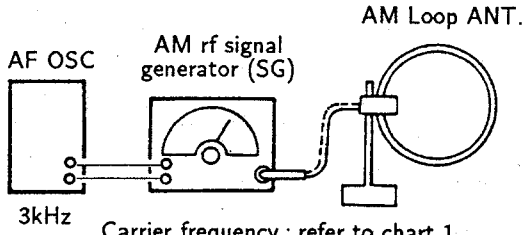


• Tune the set to 98MHz.

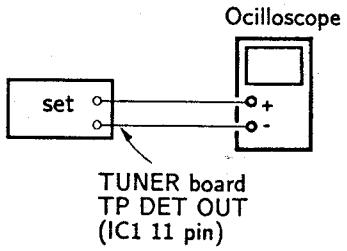
Adjustment part	Frequency counter
L9	38kHz±0.05kHz

AM Calibration Adjustment

NOTE: Follow the adjustment procedure the numerical order given.



Carrier frequency : refer to chart 1
Modulation : 30% amplitude modulation by 3kHz external signal.
Output level : more than 94dBμ/m



Function switch : RADIO
Band switch : AM

1. Tune the set frequency to "A" shown in chart 2.
2. Tune the SG frequency to "A" shown in chart 2.
3. Make a short circuit between TP (PC0) and TP (K0) on tuner board with light touch. And then, the AM calibration switch automatically change to the AM calibration mode.
4. Adjust the RV52 for a minimum waveform of oscilloscope.
5. Check the waveform when the SG frequency tuned A + 1kHz and A − 1kHz.
   It should be perform large the waveform than the waveform of column 4.
6. Make a short circuit between TP (PC0) and TP (K0) again in order to cancel the AM calibration mode.

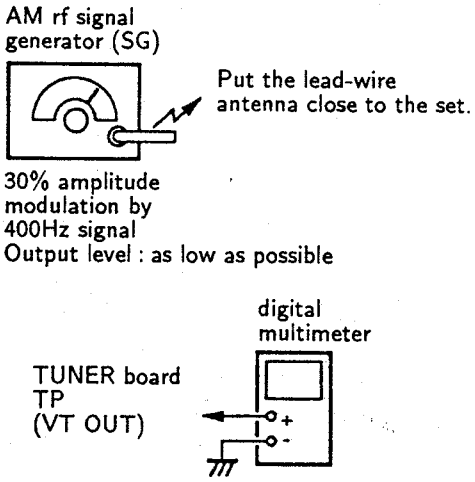
NOTE:

- The input level of the bar antenna should be 94 dBμ/m.
- AM calibration switch turns "ON" or "OFF" automatically by shorting the circuit between TP (PC0) and TP (K0).
  The set frequency can not change at AM calibration mode.

Destination	SG and set frequency	Adjustment part	Waveform of oscilloscope
US, Canadian	"A" 1000kHz	RV52	minimum
except US, Canadian	"A" 999kHz		

Chart 1

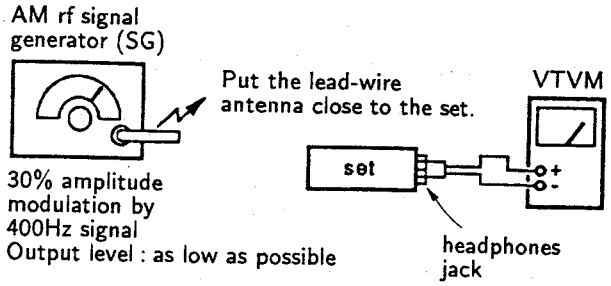
AM Tuning Voltage Adjustment



Function switch : RADIO
Band switch : AM

Destination	SG and set frequency	Adjustment part	Reading on digital multimeter
US, Canadian	530kHz	L1	1.1 ± 0.03V
AEP, UK, E	531kHz		
IT	522kHz		

AM Tracking Adjustment



Function switch : RADIO
Band switch : AM

- Repeat the procedure in each adjustment several times since L2 affects CT2 and CT2 affects L2. This adjustment should end with the final adjustment of CT2.

NOTE:
Test equipment is settled as same as AM tuning voltage adjustment.

Destination	SG and set frequency	Adjustment part	Reading on VTVM
US, Canadian	630kHz	L2	maximum
	1490kHz	CT2	
except US, Canadian	621kHz	L2	maximum
	1395kHz	CT2	

Specifications

Radio section

Frequency range
US, Canadian model :
FM : 87.5 - 108MHz (100kHz step)
AM : 530 - 1,710kHz (10kHz step)
AEP, UK, E model :
FM : 87.5 - 108MHz (50kHz step)
AM : 531 - 1,602kHz (9kHz step)
IT model :
FM : 87.5 - 108MHz (50kHz step)
AM : 522 - 1,611kHz (9kHz step)

Antennas
FM : Headphone cord antenna
AM : Built-in ferrite bar antenna

Tape player section

Frequency response
40Hz - 15kHz (Normal, CrO_2/METAL)

Power output
US, Canadian model :
5mW + 5mW 26Ω at DC operation
AEP, UK, IT model :
10mW + 10mW 26Ω at DC operation
E model :
5mW + 5mW 16Ω at DC operation
Headphones (stereo minijack) : load impedance 8 - 300Ω

Power requirements
3V DC
Two R6 (size AA) batteries
DC IN 3V jack accepts :
Optional Sony EBP-500B battery case for use with R20 (size D) batteries
Optional Sony AC-D2L power adaptor for use on :

US, Canadian model	120V AC, 60Hz
AEP, IT model	220V AC, 50Hz
UK model	240V AC, 50Hz
E model	120V AC, 60Hz or 220V AC, 50Hz

Optional Sony DCC-70 car battery cord for use with 12V car battery

Battery life

	Playback	Radio
Sony Alkaline AM3 (N)	11	32
Sony SUM-3 (NS)	4	11

(Approximate hours)

Dimensions
Approx. 86.3×112×36.2mm (w/h/d)
($3^1/_2 \times 4^1/_2 \times 17/_{16}$ inches)
not incl. projecting parts and controls

Weight
Approx. 250g (8.8oz)
incl. batteries and belt clip

Accessories supplied
Belt clip (1)
E model : Stereo earphones (1)
except E model : Stereo headphones (1)

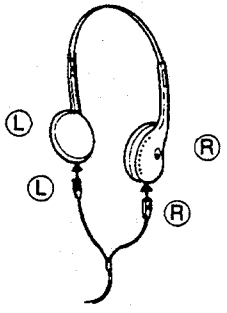
Design and specifications subject to change without notice.

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Note on stereo headphones (except E model)

The headphones cord is detachable. When you attach it, pay attention to the L and R marks. Connect the same marks.



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WM-FX40

SONY
SERVICE MANUAL

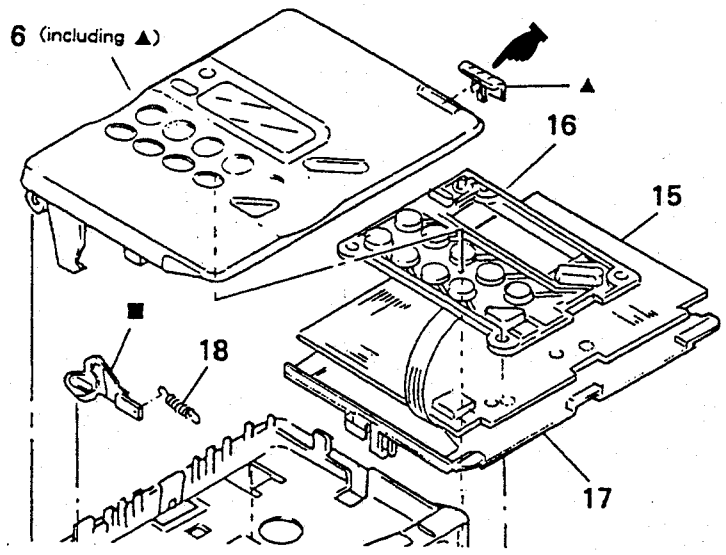
US Model
Canadian Model
AEP Model
UK Model
E Model

CORRECTION-1

Correct your service manual as shown below.

☛ : **indicates corrected portion.**

Page	INCORRECT			CORRECT	
	No.	Part No.	Description	Part No.	Description
20				3-368-372-01	KNOB (FUN) ☛



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